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KNOs: KNowledge acquisition, dissemination, and manipulation Objects

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Volume 5, Issue 1 (January 1987) [table of contents](#)

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↑ ABSTRACT

Most object-oriented systems lack two useful facilities: the ability of objects to migrate to new environments and the ability of objects to acquire new operations dynamically. This paper proposes Knos, an object-oriented environment that supports these actions. Knos' operations, data structures, and communication mechanisms are discussed. Knos objects "learn" by exporting and importing new or modified operations. The use of such objects as intellectual support tools is outlined. In particular, various applications involving cooperation, negotiation, and apprenticeship among objects are described.

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Note: OCR errors may be found in this Reference List extracted from the full text article. ACM has opted to expose the complete List rather than only correct and linked references.

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↑ INDEX TERMS

Classification:

D. Software

↳ D.1 PROGRAMMING TECHNIQUES

↳ D.3 PROGRAMMING LANGUAGES

H. Information Systems

↳ H.4 INFORMATION SYSTEMS APPLICATIONS

I. Computing Methodologies

↳ I.2 ARTIFICIAL INTELLIGENCE

General Terms:

Algorithms, Design, Experimentation, Languages

↑ REVIEW

"Chidanand V. Apte"

This research paper discusses the use of KNOs (KNowledge acquisition, dissemination, and manipulation Objects) as an advanced, computer-based tool for the office environment. KNO objects manipulate knowledge fragments with their own rules and use this to negotiate, cooperate, and learn from other KNO objects. KNOs' object-oriented architecture provides autonomous, adaptable, and

- concurrent behavior. The overall design is intended to support the critical abilities of objects to migrate to new environments and dynamically learn new operations. This paper basically is about the extension and application of object-oriented programming to office automation, and will be of interest to people working in these areas. The main drawback of this paper is that it is more of a research proposal and less of a research report. The hypothetical example of a KNOs-based system for handling transactions among multiple brokers and buyers of stock is interesting, but it provides inconclusive evidence of how KNOs' abilities contribute to significantly enhanced dynamic learning or cross-environment migration. It will certainly be worthwhile to read about the authors' experience with an implemented KNO and its application to office automation problems in a follow-up paper.
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Peter G. Neumann

January 2001 **ACM SIGSOFT Software Engineering Notes**, Volume 26 Issue 1

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22 [Local and global structuring of computer mediated communication: developing linguistic perspectives on CSCW in cosmos](#)

John Bowers, John Churcher

January 1988 **Proceedings of the 1988 ACM conference on Computer-supported cooperative work**

Full text available: [pdf\(1.88 MB\)](#)

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This paper is concerned with the development of a language/action perspective in the Cosmos project. We emphasize the importance of seeing cooperative work in terms of participants' communicative actions. In contrast to some explorations of speech act theory, we argue that communicative actions should be seen as essentially embedded in dialogical contexts. In particular, we attempt to show the relevance of concepts derived from the analysis of actually occurring conversations, for computer ...

23 [Strategic directions in artificial intelligence](#)

Jon Doyle, Thomas Dean

December 1996 **ACM Computing Surveys (CSUR)**, Volume 28 Issue 4

Full text available: [pdf\(243.02 KB\)](#)

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24 [Data streams II: Clustering of streaming time series is meaningless](#)

Jessica Lin, Eamonn Keogh, Wagner Truppel

June 2003 **Proceedings of the 8th ACM SIGMOD workshop on Research issues in data mining and knowledge discovery**

Full text available: [pdf\(648.63 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Time series data is perhaps the most frequently encountered type of data examined by the data mining community. Clustering is perhaps the most frequently used data mining algorithm, being useful in it's own right as an exploratory technique, and also as a subroutine in more complex data mining algorithms such as rule discovery, indexing, summarization, anomaly detection, and classification. Given these two facts, it is hardly surprising that time series clustering has attracted much attention. T ...

Keywords: clustering, data mining, data streams, rule discovery, time series

25 Natural language processing for information assurance and security: an overview and implementations

Mikhail J. Atallah, Craig J. McDonough, Victor Raskin, Sergei Nirenburg

February 2001 **Proceedings of the 2000 workshop on New security paradigms**

Full text available:  pdf(1.29 MB)

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26 Semantic and schematic similarities between database objects: a context-based approach

Vipul Kashyap, Amit Sheth

December 1996 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 5 Issue 4

Full text available:  pdf(287.44 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

In a multidatabase system, schematic conflicts between two objects are usually of interest only when the objects have some semantic similarity. We use the concept of *semantic proximity*, which is essentially an *abstraction/mapping* between the domains of the two objects associated with the *context of comparison*. An explicit though partial context representation is proposed and the specificity relationship between contexts is defined. The contexts are organized as a meet semi-lattice ...

27 Workshop on recommender systems: algorithms and evaluation

Ian Soboroff, Charles Nicholas, Michael Pazzani

September 1999 **ACM SIGIR Forum**, Volume 33 Issue 1

Full text available:  pdf(771.61 KB)

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28 Reference identification and reference identification failures

Bradley A. Goodman

October 1986 **Computational Linguistics**, Volume 12 Issue 4

Full text available:  pdf(3.17 MB)  [Publisher Site](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

The goal of this work is the enrichment of human-machine interactions in a natural language environment. Because a speaker and listener cannot be assured to have the same beliefs, contexts, perceptions, backgrounds, or goals at each point in a conversation, difficulties and mistakes arise when a listener interprets a speaker's utterance. These mistakes can lead to various kinds of misunderstandings between speaker and listener, including reference failures or failure to understand the speaker's ...

29 The effects of systemic packet loss on aggregate TCP flows

Thomas J. Hacker, Brian D. Noble, Brian D. Athey

November 2002 **Proceedings of the 2002 ACM/IEEE conference on Supercomputing**

Full text available:  pdf(375.56 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The use of parallel TCP connections to increase throughput for bulk transfers is common practice within the high performance computing community. However, the effectiveness, fairness, and efficiency of data transfers across parallel connections is unclear. This paper considers the impact of systemic non-congestion related packet loss on the effectiveness, fairness, and efficiency of parallel TCP transmissions. The results indicate that parallel connections are effective at increasing aggregate throughput ...

30 Design and evaluation of a context-based continuous consistency model for replicated

services

Haifeng Yu, Amin Vahdat

August 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 3

Full text available:  pdf(406.85 KB)

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The tradeoffs between consistency, performance, and availability are well understood. Traditionally, however, designers of replicated systems have been forced to choose from either strong consistency guarantees or none at all. This paper explores the semantic space between traditional strong and optimistic consistency models for replicated services. We argue that an important class of applications can tolerate relaxed consistency, but benefit from bounding the maximum rate of inconsistent access ...

Keywords: Conit, consistency model, continuous consistency, network services, relaxed consistency, replication

31 Software engineering for mobility: a roadmap

Gruia-Catalin Roman, Gian Pietro Picco, Amy L. Murphy

May 2000 **Proceedings of the conference on The future of Software engineering**

Full text available:  pdf(2.07 MB)

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32 Early user---system interaction for database selection in massive domain-specific online environments

Jack G. Conrad, Joanne R. S. Claussen

January 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 1

Full text available:  pdf(845.54 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The continued growth of very large data environments such as Westlaw and Dialog, in addition to the World Wide Web, increases the importance of effective and efficient database selection and searching. Current research focuses largely on completely autonomous and automatic selection, searching, and results merging in distributed environments. This fully automatic approach has significant deficiencies, including reliance upon thresholds below which databases with relevant documents are not search ...

Keywords: Database selection, metadata for retrieval, structuring information to aid search and navigation, user interaction

33 A general, yet useful theory of information systems

Steven Alter

March 1999 **Communications of the AIS**

Full text available:  pdf(190.54 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

34 Special issue on using large corpora: I: Structural ambiguity and lexical relations

Donald Hindle, Mats Rooth

March 1993 **Computational Linguistics**, Volume 19 Issue 1

Full text available:  pdf(1.13 MB) 

Additional Information: [full citation](#), [abstract](#), [references](#)

[Publisher Site](#)

We propose that many ambiguous prepositional phrase attachments can be resolved on the basis of the relative strength of association of the preposition with verbal and nominal heads, estimated on the basis of distribution in an automatically parsed corpus. This suggests that a distributional approach can provide an approximate solution to parsing problems that, in the worst case, call for complex reasoning.

35 SIGSAM BULLETIN: Computer algebra in the life sciences

Michael P. Barnett

December 2002 **ACM SIGSAM Bulletin**, Volume 36 Issue 4

Full text available:  [pdf\(240.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This note (1) provides references to recent work that applies computer algebra (CA) to the life sciences, (2) cites literature that explains the biological background of each application, (3) states the mathematical methods that are used, (4) mentions the benefits of CA, and (5) suggests some topics for future work.

36 Parsing with flexibility, dynamic strategies, and idioms in mind

Oliviero Stock

March 1989 **Computational Linguistics**, Volume 15 Issue 1

Full text available:  [pdf\(2.00 MB\)](#)  Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [Publisher Site](#)

One desirable aspect of a syntactic parser is being meaningful (i.e., contributing to incremental interpretation) during the process of parsing and not only at the end of it. This becomes even more important when dealing with flexible word order languages, where the number of alternatives in parsing may grow dangerously. One such parser is WEDNESDAY 2. It is a lexicon-based parser, relying on the chart mechanism combined with a particular kind of unification, guided by the so-called Principle of ...

37 Voice over IP: Intra-flow loss recovery and control for VoIP

Henning Sanneck, Nguyen Tuong Long Le, Adam Wolisz, Georg Carle

October 2001 **Proceedings of the ninth ACM international conference on Multimedia**

Full text available:  [pdf\(1.05 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

"Best effort" packet-switched networks, like the Internet, do not offer a reliable transmission of packets to applications with real-time constraints such as voice. Thus, the loss of packets impairs the application-level utility. For voice this utility impairment is twofold: on one hand, even short bursts of lost packets may decrease significantly the ability of the receiver to conceal the packet loss and the speech signal playout is interrupted. On the other hand, some packets may be particular ...

Keywords: differentiated services, loss concealment, loss metrics, loss sensitivity, objective speech quality measurement, queue management, voice over IP

38 Markets and privacy

Kenneth C. Laudon

September 1996 **Communications of the ACM**, Volume 39 Issue 9

Full text available:  [pdf\(231.63 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

39 Discovering Matrix Attachment Regions (MARs) in genomic databases

Gautam B. Singh

January 2000 **ACM SIGKDD Explorations Newsletter**, Volume 1 Issue 2

Full text available:  [pdf\(738.57 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)


Lately, there has been considerable interest in applying Data Mining techniques to scientific and data analysis problems in bioinformatics. Data mining research is being fueled by novel application areas that are helping the development of newer applied algorithms in the field of bioinformatics, an emerging discipline representing the integration of biological and information sciences. This is a shift in paradigm from the earlier and the continuing data mining efforts in marketing research and s ...

Keywords: DNA Sequence Analysis, MARs, Matrix Attachment Regions, bioinformatics, data mining, gene therapy, medical data mining

40 Features: Coaching a society of robots in accomplishing joint tasks

Marc Perron

September 2002 **Crossroads**, Volume 9 Issue 1

Full text available:  pdf(1.74 MB)

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1 [Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA](#)

Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar
January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available: [pdf\(1.16 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

2 [Special section on semantic web and data management: Agents, trust, and information access on the semantic web](#)

Tim Finin, Anupam Joshi
December 2002 **ACM SIGMOD Record**, Volume 31 Issue 4

Full text available: [pdf\(585.01 KB\)](#)

Additional Information: [full citation](#), [references](#)

3 [Launching the new era](#)

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick
March 1993 **Communications of the ACM**, Volume 36 Issue 3

Full text available: [pdf\(3.45 MB\)](#)

Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)

4 [The evolution of the corporate IT function and the role of the CIO at Texaco: how do perceptions of IT's performance get formed?](#)

Rudy Hirschheim, Jaana Porra, Michael S. Parks
November 2003 **ACM SIGMIS Database**, Volume 34 Issue 4

Full text available: [pdf\(372.21 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

While senior management's confidence in the IT function and the CIO appears to be at an all time low, the field's understanding of why this condition exists is still confused. This paper suggests that the problem lies in how perceptions about IT are formed. To this end, the paper briefly looks at the growth and evolution of the corporate IT department at the oil giant Texaco, Inc. The analysis paints a somewhat disturbing picture of a top performing IT organization, intimately responsible for th ...

Keywords: IT function history, IT management, evolution of the CIO's role, evolution of the IT function, perception formulation, perception gap

5 Natural language question-answering systems: 1969

Robert F. Simmons

January 1970 **Communications of the ACM**, Volume 13 Issue 1

Full text available:  pdf(2.15 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Recent experiments in programming natural language question-answering systems are reviewed to summarize the methods that have been developed for syntactic, semantic, and logical analysis of English strings. It is concluded that at least minimally effective techniques have been devised for answering questions from natural language subsets in small scale experimental systems and that a useful paradigm has evolved to guide research efforts in the field. Current approaches to semantic analysis ...

Keywords: artificial intelligence, fact retrieval, language processing, natural language, question-answering system, semantics

6 Inventing the networked home: Sun, 3 Com, and other companies share their visions of the future at CES

Brent Butterworth

March 2000 **netWorker**, Volume 4 Issue 1

Full text available:  pdf(1.56 MB) Additional Information: [full citation](#), [index terms](#)

7 The role of computer networks in development

Larry Press

February 1996 **Communications of the ACM**, Volume 39 Issue 2

Full text available:  pdf(330.41 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 Session summaries from the 17th symposium on operating systems principle (SOSP'99)

Jay Lepreau, Eric Eide


April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2

Full text available:  pdf(3.15 MB) Additional Information: [full citation](#), [index terms](#)

9 Query evaluation techniques for large databases

Goetz Graefe

June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

Full text available:  pdf(9.37 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of

parallelization, parallel algorithms, relational database systems, matching algorithms, sort-hash duality

10 Agents, interactions, mobility and systems: The Agent-based Programming Language: APL

Chang-Hyun Jo, Allen J. Arnold

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing**

Full text available:  pdf(448.84 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Agent-based programming has been emerged as a new programming paradigm for the near future. There have been many research work in agent computing. However, the software engineering methodology and programming languages for agent computing are not yet sufficient and practical. This paper proposes a new programming language concept based on the BDI-agent model. The new concept has been prototyped by Agent-based Programming Language (APL). The prototype system for APL translates the APL source into ...

Keywords: agent-based computing, agent-based programming Language, agent-based software engineering, agents

11 Local and global structuring of computer mediated communication: developing linguistic perspectives on CSCW in cosmos

John Bowers, John Churcher

January 1988 **Proceedings of the 1988 ACM conference on Computer-supported cooperative work**


Full text available:  pdf(1.88 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper is concerned with the development of a language/action perspective in the Cosmos project. We emphasize the importance of seeing cooperative work in terms of participants' communicative actions. In contrast to some explorations of speech act theory, we argue that communicative actions should be seen as essentially embedded in dialogical contexts. In particular, we attempt to show the relevance of concepts derived from the analysis of actually occurring conversations, for computer ...

12 Rethinking the design of the Internet: the end-to-end arguments vs. the brave new world

Marjory S. Blumenthal, David D. Clark

August 2001 **ACM Transactions on Internet Technology (TOIT)**, Volume 1 Issue 1

Full text available:  pdf(176.33 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This article looks at the Internet and the changing set of requirements for the Internet as it becomes more commercial, more oriented toward the consumer, and used for a wider set of purposes. We discuss a set of principles that have guided the design of the Internet, called the end-to-end arguments, and we conclude that there is a risk that the range of new requirements now emerging could have the consequence of compromising the Internet's original design principles. Were ...

Keywords: ISP, Internet, end-to-end argument

13 Design and evaluation of a conit-based continuous consistency model for replicated services

Haifeng Yu, Amin Vahdat

August 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 3

Full text available:  pdf(406.85 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The tradeoffs between consistency, performance, and availability are well understood. Traditionally, however, designers of replicated systems have been forced to choose from either strong consistency guarantees or none at all. This paper explores the semantic space between traditional strong and optimistic consistency models for replicated services. We argue that an important class of applications can tolerate relaxed consistency, but benefit from bounding the maximum rate of inconsistent access ...

Keywords: Conit, consistency model, continuous consistency, network services, relaxed consistency, replication

14 IP multicast channels: EXPRESS support for large-scale single-source applications

Hugh W. Holbrook, David R. Cheriton

August 1999 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 29 Issue 4

Full text available:  pdf(1.66 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In the IP multicast model, a set of hosts can be aggregated into a group of hosts with one address, to which any host can send. However, Internet TV, distance learning, file distribution and other emerging large-scale multicast applications strain the current realization of this model, which lacks a basis for charging, lacks access control, and is difficult to scale. This paper proposes an extension to IP multicast to support the *channel* model of multicast and describes a specific realization ...

15 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  pdf(4.21 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial communication ...

16 Computer-based systems for cooperative work and group decision making

Kenneth L. Kraemer, John Leslie King

July 1988 **ACM Computing Surveys (CSUR)**, Volume 20 Issue 2

Full text available:  pdf(3.56 MB)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Application of computer and communications technology to cooperative work and group decision making has grown out of three traditions: computer-based communications, computer-based information service provision, and computer-based decision support. This paper reviews the group decision support systems (GDSSs) that have been configured to meet the needs of groups at work, and evaluates the experience to date with such systems. Progress with GDSSs has proved to be slower than originally anticipated ...

17 Natural language processing for information assurance and security: an overview and implementations

Mikhail J. Atallah, Craig J. McDonough, Victor Raskin, Sergei Nirenburg

February 2001 **Proceedings of the 2000 workshop on New security paradigms**

Full text available:  pdf(1.29 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 The effects of systemic packet loss on aggregate TCP flows

Thomas J. Hacker, Brian D. Noble, Brian D. Athey

November 2002 **Proceedings of the 2002 ACM/IEEE conference on Supercomputing**

Full text available:  pdf(375.56 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The use of parallel TCP connections to increase throughput for bulk transfers is common practice within the high performance computing community. However, the effectiveness, fairness, and efficiency of data transfers across parallel connections is unclear. This paper considers the impact of systemic non-congestion related packet loss on the effectiveness, fairness, and efficiency of parallel TCP transmissions. The results indicate that parallel connections are effective at increasing aggregate t ...

19 Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research

Rob Kling

January 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 1

Full text available:  pdf(3.98 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 A critique of common LISP

Rodney A. Brooks, Richard P. Gabriel

August 1984 **Proceedings of the 1984 ACM Symposium on LISP and functional programming**

Full text available:  pdf(741.87 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A major goal of the COMMON LISP committee was to define a Lisp language with sufficient power and generality that people would be happy to stay within its confines and thus write inherently transportable code. We argue that the resulting language definition is too large for many short-term and medium-term potential applications. In addition many parts of COMMON LISP cannot be implemented very efficiently on stock hardware. We further argue that the very generality of the design with its dif ...

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1 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

 November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**
Full text available: ☒ pdf(4.21 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

2 [A model for notification systems evaluation—assessing user goals for multitasking activity](#)

D. Scott McCrickard, C. M. Chewar, Jacob P. Somervell, Ali Ndiwalana

 December 2003 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 10 Issue 4
Full text available: ☒ pdf(218.73 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Addressing the need to tailor usability evaluation methods (UEMs) and promote effective reuse of HCI knowledge for computing activities undertaken in divided-attention situations, we present the foundations of a unifying model that can guide evaluation efforts for notification systems. Often implemented as ubiquitous systems or within a small portion of the traditional desktop, notification systems typically deliver information of interest in a parallel, multitasking approach, extraneous or supp ...

Keywords: Peripheral systems, claims reuse, design model, usability

3 [Information delivery systems: an exploration of Web pull and push technologies](#)

Julie E. Kendall, Kenneth E. Kendall

April 1999 **Communications of the AIS**Full text available: ☒ pdf(658.33 KB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)
4 [Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA](#)

Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar

January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available:  [pdf\(1.16 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

5 Computing curricula 2001

September 2001 **Journal on Educational Resources in Computing (JERIC)**

Full text available:  [pdf\(613.63 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)
 [html\(2.78 KB\)](#)

6 Natural language question-answering systems: 1969

Robert F. Simmons

January 1970 **Communications of the ACM**, Volume 13 Issue 1

Full text available:  [pdf\(2.15 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Recent experiments in programming natural language question-answering systems are reviewed to summarize the methods that have been developed for syntactic, semantic, and logical analysis of English strings. It is concluded that at least minimally effective techniques have been devised for answering questions from natural language subsets in small scale experimental systems and that a useful paradigm has evolved to guide research efforts in the field. Current approaches to semantic analysis ...

Keywords: artificial intelligence, fact retrieval, language processing, natural language, question-answering system, semantics

7 Illustrative risks to the public in the use of computer systems and related technology

Peter G. Neumann

January 1996 **ACM SIGSOFT Software Engineering Notes**, Volume 21 Issue 1

Full text available:  [pdf\(2.54 MB\)](#) Additional Information: [full citation](#)

8 Launching the new era

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick

March 1993 **Communications of the ACM**, Volume 36 Issue 3

Full text available:  [pdf\(3.45 MB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#), [review](#)

9 Process migration

September 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 3

Full text available:  [pdf\(1.24 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


Process migration is the act of transferring a process between two machines. It enables dynamic load distribution, fault resilience, eased system administration, and data access locality. Despite these goals and ongoing research efforts, migration has not achieved widespread use. With the increasing deployment of distributed systems in general, and distributed operating systems in particular, process migration is again receiving more attention in both research and product development. As hi ...

Keywords: distributed operating systems, distributed systems, load distribution, process migration

10 Query evaluation techniques for large databases

Goetz Graefe

June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

Full text available:  pdf(9.37 MB)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

11 Design and evaluation of a wide-area event notification service

August 2001 **ACM Transactions on Computer Systems (TOCS)**, Volume 19 Issue 3

Full text available:  pdf(1.08 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The components of a loosely coupled system are typically designed to operate by generating and responding to asynchronous events. An event notification service is an application-independent infrastructure that supports the construction of event-based systems, whereby generators of events publish event notifications to the infrastructure and consumers of events subscribe with the infrastructure to receive relevant notifications. The two primary services that should be provided ...

Keywords: content-based addressing and routing, event notification, publish/subscribe

12 Agents, interactions, mobility and systems: The Agent-based Programming Language: APL

Chang-Hyun Jo, Allen J. Arnold

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing**

Full text available:  pdf(448.84 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Agent-based programming has been emerged as a new programming paradigm for the near future. There have been many research work in agent computing. However, the software engineering methodology and programming languages for agent computing are not yet sufficient and practical. This paper proposes a new programming language concept based on the BDI-agent model. The new concept has been prototyped by Agent-based Programming Language (APL). The prototype system for APL translates the APL source into ...

Keywords: agent-based computing, agent-based programming Language, agent-based software engineering, agents


13 Web-enabled transformation of the brokerage industry

Clayton A. Looney, Debabroto Chatterjee

August 2002 **Communications of the ACM**, Volume 45 Issue 8

Full text available:  pdf(112.61 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


 [html\(31.0 KB\)](#)

Understanding the strengths and limitations of emerging business models.

14 Session summaries from the 17th symposium on operating systems principle (SOSP'99)

Jay Lepreau, Eric Eide

April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2

Full text available:  [pdf\(3.15 MB\)](#)

Additional Information: [full citation](#), [index terms](#)

15 Complexity of finite-horizon Markov decision process problems

Martin Mundhenk, Judy Goldsmith, Christopher Lusena, Eric Allender

July 2000 **Journal of the ACM (JACM)**, Volume 47 Issue 4

Full text available:  [pdf\(461.61 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Controlled stochastic systems occur in science engineering, manufacturing, social sciences, and many other contexts. If the system is modeled as a Markov decision process (MDP) and will run ad infinitum, the optimal control policy can be computed in polynomial time using linear programming. The problems considered here assume that the time that the process will run is finite, and based on the size of the input. There are many factors that compound the complexity of computation ...

Keywords: Markov decision processes, NP, NPPP, PL, PSPACE, computational complexity, partially observable Markov decision processes, succinct representations

16 Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research

Rob Kling

January 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 1

Full text available:  [pdf\(3.98 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 The Dot Com Effect: the impact of e-commerce announcements on the market value of firms

Mani Subramani, Eric Walden

January 1999 **Proceeding of the 20th international conference on Information Systems**

Full text available:  [pdf\(255.69 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 We Talk to Everybody

Marjorie Richardson, Jason Schumaker, David Penn

June 2000 **Linux Journal**

Full text available:  [html\(96.53 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

A quick look at some of the people who helped make Linux possible.

19 Computer-based systems for cooperative work and group decision making

Kenneth L. Kraemer, John Leslie King

July 1988 **ACM Computing Surveys (CSUR)**, Volume 20 Issue 2

Full text available:  [pdf\(3.56 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Application of computer and communications technology to cooperative work and group decision making has grown out of three traditions: computer-based communications,

computer-based information service provision, and computer-based decision support. This paper reviews the group decision support systems (GDSSs) that have been configured to meet the needs of groups at work, and evaluates the experience to date with such systems. Progress with GDSSs has proved to be slower than originally anticipated.

20 Report on the 5th IFIP international workshop on quality of service (IWQOS'97)

Oguz Angin, Andrew T. Campbell, Lai-Tee Cheok, Raymond R-F Liao, Koon-Seng Lim, Klara Nahrstedt

July 1997 **ACM SIGCOMM Computer Communication Review**, Volume 27 Issue 3

Full text available:  [pdf\(1.86 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

This paper presents a summary of the fifth International Workshop on Quality of Service (IWQOS) which was held at Columbia University in May 1997. The goal of this three-day meeting was to foster interaction between researchers active in the area of Quality of Service (QOS) research, to reflect on past experiences and lessons learnt, and to discuss future QOS challenges. To reflect this goal, this year's workshop included a hot program made up of (i) a keynote address on "Programming Telecommunications ...

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1 [The implications of online investing](#)

Prabhudev Konana, Nirup M. Menon, Sridhar Balasubramanian
January 2000 **Communications of the ACM**, Volume 43 Issue 1

Full text available: [pdf\(123.87 KB\)](#)

[html\(37.58 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

2 [The Dot Com Effect: the impact of e-commerce announcements on the market value of firms](#)

Mani Subramani, Eric Walden

January 1999 **Proceeding of the 20th international conference on Information Systems**

Full text available: [pdf\(255.69 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

3 [KNOs: KNowledge acquisition, dissemination, and manipulation Objects](#)

D. Tsichritzis, E. Fiume, S. Gibbs, O. Nierstrasz

January 1987 **ACM Transactions on Information Systems (TOIS)**, Volume 5 Issue 1

Full text available: [pdf\(1.30 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Most object-oriented systems lack two useful facilities: the ability of objects to migrate to new environments and the ability of objects to acquire new operations dynamically. This paper proposes Knos, an object-oriented environment that supports these actions. Knos' operations, data structures, and communication mechanisms are discussed. Knos objects "learn" by exporting and importing new or modified operations. The use of such objects as intellectual support tools is outlined ...

4 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available: [pdf\(4.21 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

5 An Internet multicast system for the stock market

August 2001 **ACM Transactions on Computer Systems (TOCS)**, Volume 19 Issue 3

Full text available:  pdf(296.88 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

We are moving toward an international, 24-hour, distributed, electronic stock exchange. The exchange will use the global Internet, or internet technology. This system is a natural application of multicast because there are a large number of receivers that should receive the same information simultaneously. The data requirements for the stock exchange are discussed. The current multicast protocols lack the reliability, fairness, and scalability needed in this application. We describe a distr ...

Keywords: multicast

6 In good company: how social capital makes organizations work

Donald J. Cohen, Laurence Prusak

January 2001 **Ubiquity**, Volume 1 Issue 42

Full text available:  html(53.34 KB) Additional Information: [full citation](#), [index terms](#)

7 Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA

Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar
January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available:  pdf(1.16 MB) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

8 Evaluation of strategic investments in information technology

Eric K. Clemons

January 1991 **Communications of the ACM**, Volume 34 Issue 1

Full text available:  pdf(4.03 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

9 Switching cost and brand loyalty in electronic markets: evidence from on-line retail brokers

Pei-Yu Sharon Chen, Lorin M. Hitt

December 2000 **Proceedings of the twenty first international conference on Information systems**

Full text available:  pdf(240.38 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: electronic markets, empirical research, financial sector, marketing, measures

10 Early user---system interaction for database selection in massive domain-specific online environments

Jack G. Conrad, Joanne R. S. Claussen

January 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 1

Full text available:  pdf(845 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


The continued growth of very large data environments such as Westlaw and Dialog, in addition to the World Wide Web, increases the importance of effective and efficient database selection and searching. Current research focuses largely on completely autonomous and automatic selection, searching, and results merging in distributed environments. This fully automatic approach has significant deficiencies, including reliance upon thresholds below which databases with relevant documents are not search ...

Keywords: Database selection, metadata for retrieval, structuring information to aid search and navigation, user interaction

11 An object-based programming model for shared data

Gail E. Kaiser, Brent Hailpern

April 1992 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 14 Issue 2

Full text available:  pdf(3.28 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

The classical object model supports private data within objects and clean interfaces between objects, and by definition does not permit sharing of data among arbitrary objects. This is a problem for real-world applications, such as advanced financial services and integrated network management, where the same data logically belong to multiple objects and may be distributed over multiple nodes on the network. Rather than give up the advantages of encapsulated objects in modeling real-world en ...

Keywords: coordination language, daemons, financial applications, object-based, real-time, sharing

12 Computers and social change for quality long living: the Let's Connect Project

Robert V. Gallant

August 1990 **ACM SIGCAS Computers and Society , Proceedings of the conference on Computers and the quality of life**, Volume 20 Issue 3

Full text available:  pdf(219.58 KB)

Additional Information: [full citation](#), [references](#), [index terms](#)

13 Electronic futures markets versus floor trading: implications for interface design

Satu S. Parikh, Gerald L. Lohse

May 1995 **Proceedings of the SIGCHI conference on Human factors in computing systems**

Full text available:  html(48.91 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

14 Vision & challenges: Global growth of open access networks: from warchalking and connection sharing to sustainable business

Roberto Battiti, Renato Lo Cigno, Fredrik Orava, Bjorn Pehrson

September 2003 **Proceedings of the 1st ACM international workshop on Wireless mobile applications and services on WLAN hotspots**

Full text available:  pdf(226.85 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper discusses the evolution of W-LAN starting from the mere extension of LAN services indoors, through the widespread diffusion of outdoors coverage with free and often un-authorized access, to the business models supporting their evolution to public coverage HotSpots. Besides, the idea of Open Access Networks (OANs) going beyond wireless HotSpots to become a shared access infrastructure fostering service operators competition is introduced and discussed. The concept of Open Access Network ...


Keywords: 802.11, W mobility, open access networks

15 Partnerships in the U.S. telecommunications industry

Varun Grover, Pradeep Vaswani

February 2000 **Communications of the ACM**, Volume 43 Issue 2

Full text available:  pdf(160.25 KB)

 html(48.40 KB)


Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

16 Web-enabled transformation of the brokerage industry

Clayton A. Looney, Debabroto Chatterjee

August 2002 **Communications of the ACM**, Volume 45 Issue 8

Full text available:  pdf(112.61 KB)

 html(31.60 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Understanding the strengths and limitations of emerging business models.

17 Design of a financial portal

Kemal Saatcioglu, Jan Stallaert, Andrew B. Whinston

June 2001 **Communications of the ACM**, Volume 44 Issue 6

Full text available:  pdf(102.26 KB)

 html(33.42 KB)

Additional Information: [full citation](#), [references](#), [index terms](#)

18 A comprehensive agent-mediated e-market framework

Nehemiah Mavetera, Armstrong Kadyamatimba

September 2003 **Proceedings of the 5th international conference on Electronic commerce**

Full text available:  pdf(108.38 KB)

Additional Information: [full citation](#), [abstract](#), [references](#)


This paper discusses an agent-mediated e-market framework. The framework highlights the different stages and components that require automation and are required for the implementation of a full e-market system using agent technology. Most of these e-market aspects have been discussed, prototypes developed into systems but they exist as separate entities lacking a common protocol for implementation. No attention has been paid to the problem of how e-market component systems can be integrated into ...

Keywords: E-commerce, E-market framework, brokering, negotiation, software agent mediation

19 Network connectivity for developing countries

George Sadowsky

August 1993 **Communications of the ACM**, Volume 36 Issue 8

Full text available:  pdf(2.25 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: international networking, socioeconomic microanalytic simulation

20 Markets and privacy

Kenneth C. Laudon

September 1996 **Communications of the ACM**, Volume 39 Issue 9

Full text available:  pdf(231.63 KB)

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2 Conceptualizing BDI agents for financial markets

Fasli, M.;

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Pages:829 - 834 vol.2

[\[Abstract\]](#) [\[PDF Full-Text \(471 KB\)\]](#) IEEE CNF

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Comparing Artificial Intelligence Systems for Stock Portfolio Selection

Extended Abstract

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Email: Chiu-Che_Tseng@tamu-commerce.edu

Abstract

The goal of an artificial intelligence decision support system is to provide the human user with an optimized decision recommendation when operating under uncertainty in complex environments. The particular focus of our discussion is the investment domain – the goal of investment decision-making is to select an optimal portfolio that satisfies the investor's objective, or, in other words, to maximize the investment returns under the constraints given by investors. The investment domain contains numerous and diverse information sources, such as expert opinions, news releases and economic figures, and so on. This presents the potential for better decision support, but poses the challenge of building a decision support agent for selecting, accessing, filtering, evaluating, incorporating information from different sources, and for making final investment recommendations. In this study we compare three most popular artificial intelligence systems for portfolio selection. We found that the artificial intelligence systems outperform human portfolio manager and market in 1997 and 2000.

Investment Problems

The investment domain, like many other domains, is a dynamically changing, stochastic and unpredictable environment. Take the stock market as an example; there are

more than two thousand stocks available from which portfolio manager or individual investor may select. This poses a problem of filtering all those available stocks to find the ones that are worth investment. There are also vast amounts of information available that will affect the market to some degree. All above is making extremely difficult for human portfolio manager to create the investment portfolio without relying on any tools.

Related Work

We explored the way to reduce the complexity of the investment decision deliberation that might cause the investor to lose money under urgent situations, and, at the same time, to provide the highest quality investment recommendations possible. .

For portfolio management, there is related work by Sycara, et al. [5] that focused on using distributed agents to manage investment portfolios. Their system deployed a group of agents with different functionality and coordinated them under case-based situations. They modeled the user, task and situation as different cases, so their system activated the distributed agents for information gathering, filtering and processing based on the given case. Their approach mainly focused on portfolio monitoring issues and has no mechanism to deal with uncertainty and urgency factors. Our system on the other hand reacts to the real-time market situation and gathers the relevant information as needed. Other related research on portfolio selection problems has received considerable attention in both financial and statistics literature [1, 2, 3, 4, 6].

Experiment Setting for Investment Portfolio Selection

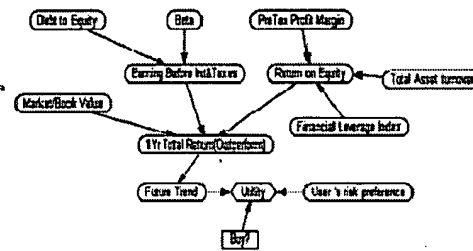
In the experiments we ran, we selected three commonly use artificial intelligence systems – Bayesian network system, C5.0 Rule base system and a feed forward neural network system as illustrated in figure1. We selected eight financial ratio data from the S&P

500 companies as the input factors to all three systems. The training data is collected from the Compustat database from the period of 1987 to 1996. To test the performance, we used the date from 1997 and 2000 and let all three systems made the decision recommendation on which of the S&P 500 companies to be included in the investment portfolio.

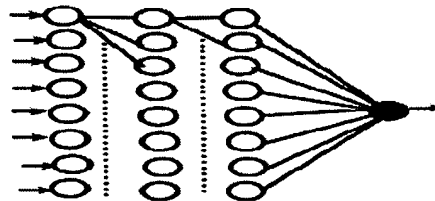
C5.0 INDUCTION SYSTEM (Release 1.10)

```
Options:
Rule from train
Rule-based classification
Read 5000 cases (8 attributes) from train.data
Decision tree:
Print: < 0.4664
... MBValue <= 2.137:
... ASST <= 0.224: yes (357.0/20.0)
... ASST > 0.224:
... ASST <= 1.497: no (4.0)
... ASST > 1.497:
... Fint <= 15.082: yes (20.0/1.0)
... Fint > 15.082:
... Beta <= 1.255: no (6.0/1.0)
... Beta > 1.255:
... MBValue <= 3.286: no (2.0)
... MBValue > 3.286: yes (10.0)
Print: < 0.4664
... MBValue <= 2.137:
... Beta <= 1.113:
```

Rule Base System (partial rules)



Bayesian Network System



Feed Forward Neural Network System

Figure 1. Three artificial intelligence systems for portfolio selection.

Experiment Result

We compared the performance of all three systems, Bayesian network, C5.0 and back-propagation neural network. We trained all three systems with the same training data and tested them with the same testing data. On the 1997 test data, Bayesian network system obtains its one year total return performance of 38.16154% when the portfolio contains the 156 selected companies. And the top 108 companies ranked by expected utility produce an

average one-year total return of 42.8264, almost twice the average of the S&P500's return and is better than the leading index fund Vanguard Index 500 which produced a 32% return for 1997.

The neural network failed to converge due to the large variation of the training data. The C5.0, the successor of the C4.5, did produce some interesting results. The C5.0 selected 218 out of the 500 companies and the average one-year total return for that portfolio is 38.90556. The C5.0 slightly outperformed the Bayesian network on 1997 data.

We also compared the performance of our system and the C5.0 using the data from year 2000 to demonstrate systems' performance in a modest year. The S&P 500 produced a negative return of -9% that year and the Vanguard index 500 fund were also in the negative territory of -8% return. Bayesian network system on the other hand produced a return of 12.23% and the C5.0 produced a return of 11.69%. In this case not only Bayesian network system outperform the market and the leading index fund, it also outperform the C5.0 algorithm.

Conclusion

We conducted some performance analysis with all three systems. We compared the two systems that was able to trained given the financial data – the Bayesian network and the C5.0 rule base system. Both systems outperform the leading mutual fund by a significant margin in 1997. We also ran the systems with the data from an under-perform year (2000); both the S&P 500 and the leading mutual fund produced a negative return for that year. Both systems on the other hand produced a positive return and outperforms the leading mutual fund and the S&P 500 index by a large margin.

Bayesian network system uses the influence diagram as the decision model; the structural information of the influence diagram plays an important role on the performance of

our system. We obtained the structural information from the domain expert and the information represents what the expert's opinion on the causal relationships among the nodes. From the experiment results we ran on an under-perform year, we can see that the Bayesian network system works better than C5.0 in a more general situation. This is due to the background information given by the domain expert when constructing the network.

Given the above analysis, we could conclude that by using a artificial intelligence system for portfolio selection has performance edge over the human portfolio manager and the market. The systems we selected for this study are only three among numerous artificial intelligence systems available. We would like to conduct further study to better qualify and quantify various artificial intelligence systems for use in the portfolio selection domain.

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A **Bayesian** Approach to Learning Causal **Networks** David

A **Bayesian** Approach to Learning Causal **Networks** David Heckerman heckerma@microsoft.com March
ftp.research.microsoft.com/pub/tr/tr-95-04.ps

[Decision Support for Image Interpretation: A Mammography.. - Taylor \(1995\) \(Correct\) \(1 citation\)](#)

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Peter Haddawy, Ph.D. The Medical Informatics and **Decision** Science (MIDAS) Consortium, Milwaukee,
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jake@introl.com ckahn@mcw.edu y **Decision** Systems and Artificial Intelligence Lab

networks are geared toward providing de cision **support**, the large number of models both currently

BANTER: A **Bayesian Network** Tutoring Shell Peter Haddawy y Joel

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[A Probabilistic Network of Predicates - Dekang Lin \(1992\) \(Correct\) \(1 citation\)](#)

in diagnosis [Pearl, 1988 Heckerman, 1990] **decision** analysis [Henrion et al.1991] story

Canada, R3T 2N2 lindek@cs.umanitoba.ca Abstract **Bayesian networks** are directed acyclic graphs

A Probabilistic **Network** of Predicates Dekang Lin Department of Computer

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[Efficient Learning of Selective Bayesian Network Classifiers - Singh, al. \(1996\) \(Correct\) \(21 citations\)](#)

are extensions of metrics used exten sively in **decision** tree learning, namely Quin lan's gain and gain
more efficiently. This pro vided experimental **support** for our proof that InfoAS has a (worstcase)

Morgan Kaufmann. Efficient Learning of Selective **Bayesian Network** Classifiers Moninder Singh Dept. of

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Constructing **Bayesian Networks** from WordNet for WordSense

Constructing **Bayesian Networks** from WordNet for WordSense Disambiguation:

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[Learning Dynamic Bayesian Networks - Ghahramani \(1997\) \(Correct\) \(29 citations\)](#)

point predictions, define error bars, or make **decisions** that are expected to minimize some loss

the work reviewed in this chapter. The author was **supported** by a fellowship from the Ontario Information

Learning Dynamic **Bayesian Networks** ?Zoubin Ghahramani Department of

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Materialized View Design and Maintenance in a Financial Data.. - An Application (Correct)
for online analytical processing (OLAP) and **decision support** [Kim96, IWG97] Typically, a data
online analytical processing (OLAP) and **decision support** [Kim96, IWG97] Typically, a data warehouse
data warehouse, namely: a) The data source, i.e. **stock** data and associated company data, has been stored
www.cs.cityu.edu.hk/~csqli/class/proposal.ps

Constructing Computationally Efficient Bayesian Models via.. - Myllymäki, Tirri (1995) (Correct) (2 citations)
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of the learning \Lambda This research was **supported** by the Technology Development Center (TEKES)
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Using Bayesian Networks as Retrieval Engines - Maria Indrawan (Correct)
such as planning, reasoning, problem solving, **decision** making and classification. Such uncertainty also
of creating information descriptors does not **supported** by exact rules, consequently, the task to
Using **Bayesian Networks** as Retrieval Engines Maria Indrawan 1*
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:15 2.1. A simple **Bayesian Network** :
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Exploiting Contextual Independence and Approximation in Belief.. - Poole (1997) (Correct) (2 citations)
rule base need not be equivalent to a simpler **decision** tree than the original. Example 3.5 Consider the
fewer distinctions. Unfortunately, the level of a **Bayesian network** is too coarse it is unlikely that a
Independence and Approximation in Belief **Network** Inference David Poole Department of Computer
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on the potential of the **Bayesian** formulation to **support** sophisticated inference, to incorporate this
A **Bayesian** framework for contentbased indexing and
model can be expressed graphically as a **Bayesian network** [6] according to Figure 1. The source state
www.media.mit.edu/~nuno/Papers/BayesRetrieval.ps.gz

Alternative Bayesian Synthesis Approaches to.. - Geof Givens (1995) (Correct)
can determine what values of ff receive the most **support** from the combined data, and which values are in
Alternative **Bayesian** Synthesis Approaches to BeringChukchiBeaufort
to BeringChukchiBeaufort Seas Bowhead Whale **Stock** Assessment: Uncertainty in Historic Catch and
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Estimating Continuous Distributions in Bayesian Classifiers - John, Langley (1995) (Correct) (26 citations)
approaches to machine learning, such as **decisiontree** induction and neural **networks**. For example,
attributes (Buntine 1994) These assumptions **support** very efficient algorithms for both
Estimating Continuous Distributions in **Bayesian** Classifiers George H. John Computer Science
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Netherlands Abstract Specialcase algorithms for **Bayesian belief networks** are designed to alleviate the

A CaseBased Filter for Diagnostic **Belief Networks** \Lambda N.B. Peek Dept. of Law and

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CA Integrating Natural Language Subtasks with **Bayesian Belief Networks** Ted Pedersen Department of

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Networks (QPNs) are an abstraction of **Bayesian belief networks** replacing numerical relations by

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Efficient Reasoning in Qualitative Probabilistic **Networks** \Lambda Marek J. Druzdzel Carnegie Mellon

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[riso: An Implementation of Distributed Belief Networks - Robert Dodier \(1999\) \(Correct\)](#)

& Xiang 1997) who refer to 'multiplysectioned **Bayesian networks**' which have a certain strict defini

riso: An Implementation of Distributed **Belief Networks** Robert Dodier University of Colorado at

civil.colorado.edu/~dodier/papers/aies-aaai-distributed.ps

[Belief Propagation in Qualitative Probabilistic Networks - Druzdzel \(1993\) \(Correct\) \(4 citations\)](#)

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Belief Propagation in Qualitative Probabilistic Networks 3 Marek J. Druzdzel Carnegie Mellon University

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[Practicable Sensitivity Analysis Of Bayesian Belief Networks - Coupe, van der Gaag \(1998\) \(Correct\)](#)

Practicable Sensitivity Analysis Of **Bayesian Belief Networks** Veerle M.h. Coup' E Center For

Practicable Sensitivity Analysis Of **Bayesian Belief Networks** Veerle M.h. Coup' E Center For Clinical

Sensitivity Analysis Of **Bayesian Belief Networks** Veerle M.h. Coup' E Center For Clinical Decision

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[Sensitivity Analysis: an Aid for Belief-network.. - Coupe, van der Gaag.. \(2000\) \(Correct\)](#)

e-mail: linda@cs.uu.nl Abstract When building a **Bayesian belief network**, usually a large number of

Sensitivity Analysis: an Aid for **Belief-network** Quanti cation Veerle M.H. Coupe 1 ,

www.cs.vu.nl/~marx/rook/gaag13.ps

[Why the logistic function? A tutorial discussion on.. - Michael Jordan \(1995\) \(Correct\) \(3 citations\)](#)

for the modeling of data. Crudely put, the **belief net work** community has tended to focus on the

A tutorial discussion on probabilities and neural **networks** Michael I. Jordan Massachusetts Institute of

www.dcs.shef.ac.uk/~ljupco/papers/uai.ps.gz

[Properties of Sensitivity Analysis of Bayesian Belief Networks - Coupe, van der Gaag \(1999\) \(Correct\)](#)

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[Learning Bayesian Networks from Incomplete Databases - Ramoni, Sebastiani \(1997\) \(Correct\) \(10 citations\)](#)

Learning **Bayesian Networks** from Incomplete Databases Marco Ramoni

to learn the graphical structure of **Bayesian Belief Networks** (bbns) from databases share the

Learning **Bayesian Networks** from Incomplete Databases Marco Ramoni Paola

kmi.open.ac.uk/techreports/papers/kmi-93.ps.gz

Generation Of Bayesian Networks From Databases - Yu, Sy (Correct)

Generation Of **Bayesian Networks** From Databases Yanqiang Yu 1 Bon

11367 Abstract Current applications of **Bayesian belief networks** rely on a laborious and time consuming

Generation Of **Bayesian Networks** From Databases Yanqiang Yu 1 Bon K. Sy 2

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ftp.cs.uu.nl/pub/RUU/CS/techreps/CS-1999/1999-32.ps.gz

Generalized Probabilistic Reasoning and Empirical Studies on.. - Baenen (Correct)

:6 2.1 **Bayesian Networks** :

: 16 2.5.1 **Bayesian Belief Networks** : 17 2.5.2

www.afit.af.mil/EN/ai/Papers/Thesis/ebaenen.ps.gz

An Algorithm for Inferences in a Polytree with Heterogeneous.. - Robert Dodier (Correct)

D. Morrell. 1995) Implementation of continuous **Bayesian networks** using sums of weighted Gaussians.

different types of conditional distributions in a **belief network**. The algorithm is based on the polytree

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civil.colorado.edu/~dodier/papers/arbitrary-polytree.ps

Reasoning MPGE in Belief Networks with Applications to.. - Bon Sy Yanqiang (Correct)

Roslyn, New York 11576 (516) 4844610 Abstract A **Bayesian belief network** represents the probabilistic

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Computational Intelligence Practical Assignment II - Me Nt li (Correct)

tool for the creation and consultation of **Bayesian belief networks** and in uence diagrams. Both

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www.csd.abdn.ac.uk/~plucas/teaching/CS4017/prac3.ps.gz

Learning Bayesian Belief Networks Based on the MDL Principle.. - Joe Suzuki (1996) (Correct) (5 citations)

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[Learning Dynamic Bayesian Networks - Ghahramani \(1997\)](#) (Correct) (29 citations)

Learning Dynamic **Bayesian Networks** ?Zoubin Ghahramani Department of Computer
(a.k.a. probabilistic graphical models or **belief networks**) a marriage of probability theory and
Y t g. In most realistic scenarios, from modeling **stock** prices to physiological data, the observations
ftp.cs.toronto.edu/pub/zoubin/vietri.ps.gz

[Learning Markov Processes - Murphy \(2001\)](#) (Correct)

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we may not be able to predict the exact price of a **stock** tomorrow, we may be able to predict its expected
http.cs.berkeley.edu/~murphyk/Papers/markov.ps.gz

[Time Sensitive Sequential Myopic Information Gathering - Tseng, Gmytrasiewicz](#) (Correct)

user. An influence diagram can be viewed as a **Bayesian network** with decision and utility nodes, where the
available is C, which can be represented as **belief** regarding the values of the different random
this paper, we create a model to represent the **investment** scenario of a novice **stock** investor. By using
dali.uta.edu/steven/mtdmk07.ps

[Toward a Market Model for Bayesian Inference - Pennock, Wellman \(1996\)](#) (Correct)

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provide a useful framework for investigations of **belief** aggregation, distributed probabilistic inference,
are well recognized. For example, the price of a **stock** represents the 'market evaluation' of the ex
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[Parameter Learning in Object Oriented Bayesian Networks - Langseth, Bangsø \(2001\) \(Correct\) \(1 citation\)](#)

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[Fusion of Domain Knowledge with Data for Structural Learning ... - Langseth, Nielsen \(Correct\)](#)

April, 2002 Abstract When constructing a **Bayesian network**, it can be advantageous to employ Finally, to model the four cows in the live-**stock** we construct a class **Stock** that encapsulates the on Fusion of Domain Knowledge with Data for **Decision Support**. Department of Computer Science Decision www.cs.auc.dk/research/DSS/papers/technical.ps

[Time Sensitive Sequential Myopic Information Gathering - Tseng, Gmytrasiewicz \(Correct\)](#)

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